KENDRIYA VIDYALAYA SANGATHAN, SILCHAR REGION
PRE-BOARD EXAMINATION: 2025-26
CLASS 10
SUB: MATHEMATICS STANDARD (CODE: 041)

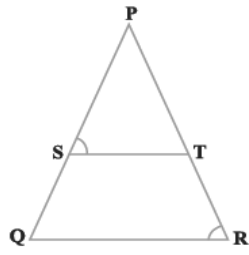Time Allowed: 3 Hours   Maximum Marks: 80

General Instructions:

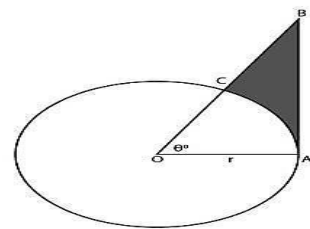Read the following instructions carefully and follow them:

1. This question paper contains 38 questions.

2. This Question Paper is divided into 5 Sections A, B, C, D and E.

3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19   and 20 are Assertion- Reason based questions of 1 mark each.

4. In Section B, Questions no. 21-25 are Very Short Answer (VSA) type questions, carrying 02 marks each.

5. In Section C, Questions no. 26-31 are Short Answer (SA) type questions, carrying 03 marks each.

6. In Section D, Questions no. 32-35 are Long Answer (LA) type questions, carrying 05 marks each.

7. In Section E, Questions no. 36-38 are case study-based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.

8. All Questions are compulsory. However, an internal choice in 2 Questions of Section B, 2 Questions of Section C and 2 Questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.

9. Draw neat and clean figures wherever required.

10. Take π =22/7 wherever required if not stated.

11. Use of calculators is not allowed.
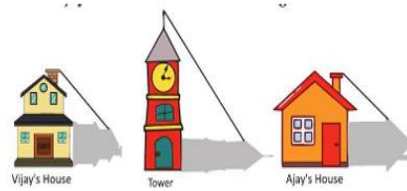
Q.No	SECTION-A (1 Marks Each)	Marks
1	The sum of all two-digit odd numbers is (a) 2575　　　　(b) 2475　　　　(c) 2524　　　　(d) 2425	1
2	If zeroes of the quadratic polynomial ax^2+ bx +c (a, b, c ≠0) are equal, then (a) c and b must have opposite signs　　(b) c and a must have opposite signs (c) c and b must have same signs　　(d) c and a must have same signs	1
3	If the volume of hemisphere is $18\pi\ cm^3$, then its diameter is (a)$12cm$　　　　(b) $3\ cm$　　　　(c) $4.5\ cm$　　　　(d) $6\ cm$	1
4	If $x = r\ sinA\ cosC,\ y = r\ sinA\ sinC\ and\ z = r\ cosA$, then prove that x² + y² + z² ?. (a) 3r²　　　　(b)r² +3　　　　(c) 3r² +3　　　　(d) r²	1
5	Mode is the value of the variable which has (a)　　Minimum frequency　　　　(b) mean frequency	1

	(c) maximum frequency (d) middle most frequency	
6	The HCF(a,8) = 4 , LCM (a,8) = 24, then a is (a) 8 (b) 10 (c) 12 (d) 14	1
7	The co-ordinates of the point which is reflection of point (-3 , 5) in x-axis are (a) (3, 5) (b) (3, -5) (c) (-3, -5) (d) (-3 ,5)	1
8	If the sum of the circumferences of two circles with radii R_1 and R_2 is equal to the circumference of a circle of radius R, then (a) $R_1 + R_2$ = R (b) $R_1 + R_2$ > R (c) $R_1 + R_2 \leq$ R (d) $R_1 + R_2$ < R	1
9	A quadratic polynomial, the sum of whose zeroes is 0 and one zero is 3, is (A)$x^2 + 9$ (B)$x^2 - 9$ (C)$x^2 + 3$ (D)$x^2 - 3$	1
10	Two coins are tossed simultaneously. What is the probability of getting at most one head ? (a)¼ (b) ½ (c) ¾ (d) 1	1
11	The point P which divides the line segment joining the points A(2, –5) and B(5, 2) in the ratio 2: 3 lies in the quadrant (a) I (b) II (c) III (d) IV	1
12	If $cosA = \frac{1}{2}$ then the value of , $(cosA - secA) is$ (a) $\frac{3}{2}$ (b) $-\frac{3}{2}$ (c) $\frac{\sqrt{3}}{2}$ (d) $-\sqrt{\frac{3}{2}}$	1
13	A cone, a hemisphere and cylinder are of the same base and of the same height. The ratio of their volumes is (a) 1 : 2 : 3 (b) 2 : 1 : 3 (c) 3 : 1 : 2 (d) 3 : 2 : 1	1
14	If -1 is a zero of the polynomial kx^2-4x+k, the value of k is (a) -4 (b) -2 (c) 2 (d) 4	1
15	If a pair of linear equations in two variables is consistent, then the lines represented by two equations are (a) always intersecting (b) parallel (c) always coincident (d) intersecting or coincident	1
16	The empirical relation between mode, median and mean of a distribution is (a) Mode = 3 Median-2 Mean (b) Mode = 3 Mean-2 Median (c) Mode = 2 Median-3 Mean (d) Mode = 2 Mean-3 Median	1
17	Which of the following cannot be the probability of an event? (a) 1.5 (b) $\frac{3}{5}$ (c) 25 % (d) 0.3	1
18	The probability of getting a bad egg in a lot of 400 is 0.035. The number of bad eggs in the lot is (a) 7 (b) 14 (c) 21 (d) 28	1

19	Direction : In the question number 19 & 20 , A statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option (a) Both Assertion (A)and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of Assertion (A) (c) Assertion (A) is true but Reason (R) is false. (d) Assertion (A) is false but reason (R) is true. Assertion (A): $4x^2 - 12x + 9 = 0$ = has repeated roots. Reason (R): The quadratic equation $ax^2 + bx + c = 0$ have repeated roots if discriminant D > 0	1
20	Assertion (A) : The measure of angle included between the lines represented by $x = 0$, $y = 0$ and the co-ordinate of the point of intersection of these lines are respectively 90° , (0,0) Reason (R) : The intersecting point of co-ordinate axes is origin and its co-ordinate is (0,0).	1
	SECTION-B (2 MARKS)	
21	(a) If the lines given by $3x + ky = 2$ and $2x + 5y = -1$ are parallel, then find the value of k. OR (b) Solve the following pair of equations $217x + 131y = 913$ $131x + 217 y = 827$	2
22	Two numbers are in the ratio of 15:11. If their H.C.F. is 13, then find the numbers.	2
23	If $tan A + sin A = m \, and \, tan A - sin A = n$, then show that $m^2 - n^2 = 4\sqrt{mn}$	2
24	24(A)Two different dice are tossed together. Find the probability: (i) that the number on each die is even. (ii) that the sum of numbers appearing on the two dice is 5 OR 24(B) The probability of selecting a blue marble at random from a jar that contains only blue, black and green marbles is 1/5. The probability of selecting a black marble at random from the same jar is 1/4. If the jar contains 11 green marbles, find the total number of marbles in the jar.	2
25	In given figure $\frac{PS}{SQ} = \frac{PT}{TR} \, and \, \angle PST = \angle PRQ$. Prove that PQR is an isosceles triangle.	2
	SECTION-C (3MARKS)	
26	Prove that $\sqrt{5}$ is irrational No. What is the Sum of Two irrational No's	3
27	Given the linear equation 4x+6y−16 = 0, write another linear equation in two variables such that the geometrical representation of the pair so formed is:	3 (1+1

	(a) Intersecting lines (b) Parallel lines (c) Coincident lines		+1)
28	Prove that $\frac{sin\theta-cos\theta+1}{sin\theta+cos\theta-1} = \frac{1}{sec\,\theta-tan\theta}$, using the identity $sec^2\theta = 1 + tan^2\theta$		3
29	29(A)Find the coordinates of the points of trisection of the line segment joining (4, −1) and (−2, −3). OR 29(B)Find the ratio in which $P(4, m)$ divides the segment joining the points A(2,3) and B (6,−3). Hence find m.		3
30	(a) Prove that a Rectangle ABCD is circumscribe a circle is a Square. OR (b) PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length TP.		3
31	From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm^2.		3
	SECTION-D(5 MARKS)		
32	State and prove Basic Proportionality Theorem.		5
33	(a) The lower window of a house is at a height of 2 m above the ground and its upper window is 4m vertically above the lower window. At certain instant, the angles of elevation of a balloon from these windows are observed to be 60° and 30°, respectively. Find the height of the balloon above the ground. OR (b) From the top of a 60 m high building, the angles of depression of the top and the bottom of a tower are 45° and 60° respectively. Find the height of the tower. [Take √3 = 1.73]		5
34	Figure shows a sector of a circle, centre O, containing an angle θ. Prove that: (i) Perimeter of the shaded region is r(tan θ + sec θ+$\frac{\pi\theta}{180}$ −1) (ii) Area of the shaded region is $\frac{r^2}{2}$ $(tan\theta - \frac{\pi\theta}{180})$		5
35	35(A) manufacturer of TV sets produced 600 sets in the third year and 700 sets in the seventh year. Assuming that the production increases uniformly by a fixed number every year, find : (i) the production in the 1st year (ii) the production in the 10th year (iii) the total production in first 7 years OR 35(B) RCB Machine Pvt Ltd started making road roller 10 year ago. Company increased its		5

production uniformly by fixed number every year. The company produces 800 roller in the 6th year and 1130 roller in the 9th year.
(i) What was the company's production in first year?
(ii) What was the company's production in the 8th year?
(iii) What was the company's total production of the first 6 years?
(iv) What was the increase in the company's production every year?
(v) In which year the company's production was 1350 rollers?

SECTION-E(4MARKS)	

36	The speed of a motor boat is 20 km/hr. For covering the distance of 15 km the boat took 1 hour more for upstream than downstream.	
	(i). Let speed of the stream be x km/hr. then speed of the motorboat in upstream will be	1
	(a) 20 km/hr (b) (20 + x) km/hr	
	(c) (20 – x) km/hr (d) 2 km/hr	
	(ii). What is the relation between speed ,distance and time?	1
	(a) speed = (distance)/time (b) distance = (speed)/time	
	(c) time = speed x distance (d) speed = distance	
	(iii). (A) How much time boat took in downstream?	2
	OR	
	(iii)(B) How much time boat took in upstream?	

37	Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles. The height of Vijay's house if 20m when Vijay's house casts a shadow 10m long on the ground. At the same time, the tower casts a shadow 50m long on the ground and the house of Ajay casts 20m shadow on the ground.	
	(i). What is the height of the tower?	1
	(ii). What is the height of Ajay's house ?	1
	(iii)(a). What will be the length of the shadow of the tower when Vijay's house casts a shadow of 12m ?	2
	OR	
	(iii)(b)When the tower casts a shadow of 40m, same time what will be the length of the shadow of Ajay's house ?	
38	The given distribution shows the number of runs scored by top batsmen in One-Day Internationals.	

Runs scored	Number of batsmen
3000 – 4000	5
4000 – 5000	15
5000 – 6000	10
6000 – 7000	8
7000 – 8000	6
8000 – 9000	2
9000 – 10000	3

Answer the questions based on the above data:
(i) What is the modal class of the data? — 1
(ii) What is the frequency of the class preceding the modal class? — 1
(iii)(A) What is the modal value of the above data? — 2
OR
(iii)(B) Find the median of the above data.